



Impacts of Age Changes on the Temporomandibular Joint Ankyloses: A Contribution of Risk Factors

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Abstract

Objectives: To investigate the risk factors that can cause and develop the Temporomandibular Joint ankylosis in various age groups.

Materials and Methods: This is retrospective study. One hundred and twenty patients were analyzed during the period of January 2015-December 2017 at the department of oral and maxillofacial surgery, King Edward Medical University, Mayo Hospital Lahore, Pakistan. In relation to age, patients were categorized into four groups A, B, C and D comprising of 6 months - 10 years, 11 - 17 years, 18 -25 years and >25 years respectively. Identified risk factors were including trauma with the history of fall or road traffic accidents, middle ear infection and autoimmune diseases. Incidence trends were also noted.

Results: Trauma was the main factor in TMJ ankylosis caused either by fall or road traffic accidents. Group B represented the highest percentage of patients. Countless etiological factors had been attributed to TMJ ankylosis. However, patients with a history of fall and Road traffic accidents (RTA) estimated 75.8% (n = 91) and 11.6% (n = 14) of the cases correspondingly.

Conclusion: This study proves that trauma either falls or road traffic accident, represent the main contributory factor of TMJ ankylosis in Pakistan.

Keywords: Age Groups; Temporomandibular Joint; Ankylosis; Risk Factors; Incidence Trends

Introduction

A Greek terminology meaning Stiff joint called Ankylosis [1]. Temporomandibular joint is a unique synovial joint which perform both sliding and Hinge movements. Joints articulating surfaces are lined by fibrocartilage [2]. TMJ Ankylosis is a fusion of joint between head of condyle and glenoid fossa or an intra-capsular union of condylar disc complex with temporal articulating surfaces that includes fibrous adhesion [3]. Because of immobility of joint, the jaw function gets affected [1].

It is mainly associated with Trauma, degenerative joint diseases, local or systemic infection, neoplasms and surgical intervention [4]. Trauma leads to develop TMJ ankylosis. Infrequently, it can also developed by septic arthritis and ankylosing spondylitis [5].

Although TMJ ankylosis is one of the most common pathological disorder which affects the facial skeleton. It is most overlooked and under-managed problem in children. It particularly affects the children and young adults [6]. Devastating effect on growth and development of jaws and teeth can be seen in early childhood. In addition, conspicuous facial deformity can also cause negative impact on psychosocial development of child [7]. TMJ ankylosis can be classified into various types e.g. True or false, Extra and Intra-articular, Fibrous, Fibro-osseous or bony, Unilateral or bilateral and Partial or complete [1].

In North America and Europe, because of earlier management of condylar fractures and proper utilization of drugs (e.g. antibiotics); the incidence and recurrence rate of TMJ ankylosis is

reduced. Relatively, it is very common in developing countries (e.g. Pakistan) because of childhood trauma [8]. Parents either ignore their post-traumatic effects or traumatic patients are not managed by hospital staff [9]. Gap arthroplasty with inter positioning of a flap is performed to prevent the development of re-ankylosis [10].

Methodology

This is cross-sectional retrospective study. One hundred and twenty patients were analyzed during the period of January 2015-December 2017 at the department of oral and maxillofacial surgery, King Edward Medical University, Mayo Hospital Lahore, Pakistan. One hundred and twenty cases were categorized into four groups e.g. Group A (6 months to 10 years), Group B (11-17 years), Group C (18-25 years) and Group D (> 25 years) with respect to age to point out all the risk factors that can cause and develop the Temporomandibular Joint ankylosis in different age groups. Patients demographics e.g. name, age, gender, occupation, address and contact details were noted by researchers. Frequency of TMJ Ankylosis was also noted. Symptoms, types, severity, duration and detailed history of the joint ankylosis were also recorded. Systemic examination of patients was also noted. Any history of fall, degenerative joint diseases, road traffic accidents, infectious diseases and joint surgery were in special consideration. For the definite diagnosis of temporomandibular joint ankylosis, facial asymmetry, occlusal relationship, mouth opening and chin deviation were examined by Intra and Extra oral examination. Radiographic study especially an Orthopantomogram (OPG) was also done in TMJ ankylotic patients for definite diagnosis. Both unilateral and bilateral TMJ ankylotic cases were diagnosed in this study. Total of one twenty and hundred cases with limited mouth opening, eating/ chewing problems were included. Patients with any limitation due to extra-articular cause and patients with ankyloses due to forceps delivery were excluded from the study. Patients who are unwilling to participate in research project. Critically ill patients were also excluded. All variables were analyzed in SPSS version 21. Chi

square test was applied. Qualitative variables like gender, fall, road traffic accidents etc. are presented in frequency and percentages. Quantitative variables like age has also presented in percentage. Different age groups were designed to make groups.

Results

One hundred and twenty patients were analyzed in this study. Group B represented the highest percentage of patients which is 50% and Group A represented 25% of patients. Group’s distribution according to the patients age is given in Table 1. Multiple risk factors had been attributed to TMJ ankylosis. However, patients with a history of fall and Road traffic accidents (RTA) estimated 75.8% and 11.6% of the cases correspondingly. 5.0% of TMJ ankylotic cases were mentioned with unknown risk factors. In this analysis, 25.2% of cases in Group A, 53.9% of the cases in Group B, 13.18% of the cases in Group C and 7.6% of cases in group D were presented with history of fall which was a most contributing (or risk) factor while road traffic accident was presented as a risk factor in 14.2% of patients in Group A, 28.5% of patients in Group B, 21.4% of patients in Group C and 35.7% of patients in Group D. Unknown risk factor were not include in this study. In Group A = 0.0%, Group B = 66.6%, Group C = 0.0% and Group D= 33.3% of the cases were labeled as patients with unknown risk factor. Risk Factors distribution according to age ratio is shown in Table 2. Surgical treatment and specialist consultation were received by 83% of patients and oral and maxillofacial surgery department, Mayo Hospital, Lahore was the place where TMJ ankylotic patients were surgically treated while 17% patients were not treated for this reason.

Groups	Age Groups in years	N	Percentage
A	6 months-10 years	30	25.0%
B	11-17 years	60	50.0%
C	18-25 years	15	12.5%
D	>25 years	15	12.5%

Table 1: Groups distribution according to the patients age.

Risk Factors	Age distribution				
	Group A	Group B	Group C	Group D	Total Number
Fall (n %)	23 (25.27%)	49 (53.85)	12 (13.18%)	7 (7.6%)	91 (100)
Road Traffic Accident (n %)	2 (14.2%)	4 (28.5%)	3 (21.4%)	5 (35.7%)	14 (100)
Middle ear infection (n %)	3 (60%)	2 (40%)	0 (0.0%)	0 (0.0%)	5 (100)
Arthritis (n %)	2 (50%)	1 (25%)	0 (0.0%)	1 (25%)	4 (100)
Unknown (n %)	0 (0.0%)	4 (66.6%)	0 (0.0%)	2 (33.3%)	6 (100)

Table 2: Risk Factors distribution according to age ratio.

Discussion

Previous research indicates that age is the primary risk factor of TMJ ankylosis after condylar fracture [13]. The secondary factor is the serious damage to the glenoid fossa and condylar cartilage and displacement of the disc [14,15]. The muscular splinting or prolonged mechanical immobilization is the tertiary cause. However, the risk factors remain unclear [16,17]. This article investigates the risk factors that can cause and develop the TMJ ankylosis in various age groups. Furthermore, this study may provide identifying etiological factors, which may increase the awareness about the problem.

Knowledge related to etiological factors of TMJ ankylosis has not progressed to the same extent as surgical methods for treating the condition, and range of differences in etiological factors can be considered one of the attributable reasons as well. Our study is also hampered by same problem as time lapse is often a barrier to accurate designation of etiology and lack of information given by patients.

Trauma is the main cause of TMJ ankylosis. Subsequent fibrosis and bony formation can produce stiffness of jaws [8]. Warraich and Cheema reported that 53% cases with TMJ ankylosis belonged to 10 to 20 years of age (mean age ratio = 13 years)-2001 [11] and in 2011, again khatak; Warraich and Kundi were reported that 55.9% of cases belonged to 11-17 years of age (mean age =13 years) [12].

So, previous findings co relate with the present findings which indicates that most of the patients belonged to Group B (mean age = 12 years). According to the findings of other researchers, major risk factor for TMJ ankylosis was trauma (Fall+ Road traffic accident).

Li *et al* and He *et al* were considered only traumatic patients and patients with condylar fractures and reported that trauma was the major risk factors in TMJ ankylotic patients [13].

Sharma and Dave reported that 67.8% cases were associated with trauma and only 17% cases were associated with infection [14]. Su-Gwan found that 85.7% cases were experienced trauma that is the major cause of unilateral TMJ ankylosis [15].

Recent study proved that 87.4% cases were experienced trauma that is the major reason for TMJ ankylosis. 53.8% of cases (from

Group B) were developed TMJ ankylosis due to fall While 28.5% of cases were experienced TMJ ankylosis due to road accident traffic. In this age group, children are involved in different games e.g. bicycle riding and sports.

Trauma during fall from roof (on the ground during sports) and stairs are the main events which will cause sub-condylar fracture and leads to develop TMJ ankylosis. Most cases of fall of our study were belonging to kite flying. Joint inflammation may also cause by mastoiditis, osteomyelitis of the temporal bone, Otitis media or abscesses (either condyle or soft tissue). Incidences of TMJ ankylosis due to infectious diseases have reduced with the advent of antibiotics. In our study, patients in Group A and B experienced middle ear infection.

Arthritis is another significant factor of TMJ ankylosis. According to present findings, most of cases from Group A, B and D were experienced arthritis. It is suggested that the patients with traumatic history, wound over the chin and tenderness over the joint need complete evaluation for definite treatment to prevent from TMJ ankylosis.

Conclusion

This study proves that trauma either falls or road traffic accident, represent the main contributory factor of TMJ ankylosis in Pakistan.

Recommendation

Considering the results of this study it is recommended that the paediatric patients with trauma and infection should be adequately managed to prevent the development of TMJ ankylosis. It is also recommended that public awareness should be developed regarding development of ankylosis after trauma or middle ear infection.

Disclaimer

Manuscript was not presented or published in any conference or meeting previously.

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